







# NEW METHOD

O F

## INOCULATING

FOR THE

S M A L L P O X

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DELIVERED

IN A LECTURE IN THE UNI-VERSITY OF PHILADELPHIA, Feb. 20th, 1781.

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### STUDENTS OF MEDICINE

IN THE

MEDICAL SCHOOL OF PHILADELPHIA

### THE FOLLOWING LECTURE

IS INSCRIBED;

AS A TESTIMONY OF THE CONSTANT AND PUNCTUAL ATTENDANCE, WITH WHICH THEY WERE PLEASED TO HONOUR THE LECTURES UPON THE PRACTICE OF PHYSIC. Delivered (at their request) in the winter of 1780—1.

BY THEIR FRIEND

AND HUMBLE SERVANT

THE AUTHOR:

### GENTLEMEN,

I must afford no small pleasure to a benevolent mind in the midst of a war, which daily makes so much havock with the human species, to reslect, that the small-pox which once proved equally satal to thousands, has been checked in its career, and in a great degree subdued by the practice of INOCULATION.

It is foreign to my purpose to deliver to you the history of this art, and to mark the various steps that have attended its progress to its present state of improvement. We have yet to lament the want of uniformity and of equal success in the practice of it among physicians. A great number of paniphlets have been written upon the subject without exhausting it. There is still ample room left for the man of genius to exercise his talents for observation and reasoning onit. The facts I mean to lay before you are so inconsiderable, compared with what still remain to be known upon this subject, that I have to request, when your knowledge in it is compleat-

ed, that you would bury my name in filence; and forget that ever I ventured to lay a fingle stone in this part of the fabric of science.

In treating upon this subject, I shall

- I. Confider the proper subjects and seafons for Inoculation.
- II. I shall describe the method of communicating the disorder.
- III. I shall consider the method of preparing the body for the small-pox.
- IV. I shall mention the treatment proper during the eruptive fever, and
- V. Point out a few cautions that are neceffary after the difease is over.
- I. Formerly there were great difficulties in the choice of the subjects for Inoculation. But experience teaches us that it may be practifed in every stage of life, and in almost every condition of the human body.—In infancy the periods before and after dentition are to be preserted.—But we seldom see any great inconveniencies from submitting to the general necessity of inoculating children between the ages of three

months

months and two years .- Indeed we often fee children cut three or four teeth during the preparation and eruptive fever without the least addition being made to any of the troublesome symptoms which accompany the fmall-pox. There is one inconvenience attending the choice of the first months of infancy for inoculating, and that is the matter often fails of producing the diforder in fuch young fubjects. I have frequently failed in two or three attempts to communicate the diforder to children under four months old with the fame matter that has fucceeded in a dozen other patients inoculated at the same time. - When the Inoculation succeeds in such tender subjects, they generally have less fever, and fewer pustules than are common in any future period of life.

Altho' a physician would prefer a patient in good health to any other as a subject for Inoculation, yet cases often occur in which it is necessary to communicate the small-pox while the body is affected with some other disorder. I can with pleasure inform you, that the small-pox is rendered so perfectly safe by Inoculation, that there are sew chronic diseases which should be considered as obstacles in the way of it. I have inoculated patients labouring under a terrian

tertian fever, obstructed viscera, the hooping cough, the hypochondriasis, the asthma, the itch, and other cutaneous diforders, and even pregnant women with the fame, and in some instances, with greater success than persons in persect health. Doct. Cullen informs us that he has feen Inoculation succeed in scrophulous patients. A physician in Jamaica informed me that he had inoculated Negroes with success in the worst stage of the Yaws.-To these facts I must add one more extraordinary than any that has been yet mentioned .- Doct. Brown, my late colleague in the care of the military hospitals, informed me, that he had feen Inoculation fucceed in patients who were feized, after the infection was communicated, with the hospital fever .- The preparation of the body should be accommodated to the disease which affects it. Some physicians have thought the fmall-pox received in this way, was a remedy for other diseases, but my experience has not confirmed this opinion. On the contrary I am disposed to think that no other change is produced by Inoculation than by the regimen and medicines that are used to prepare the body for the smallpox. Nor does the fmall-pox during its continuance afford any fecurity against the attacks of other diseases. I have seen the most alarming

complication of the small-pox and measles in the same person.

The feafons commonly preferred for Inoculation in this country are the fpring and fall. It may be practifed with equal fafety in the winter, a due regard being had to the temperature of the air in the preparation of the body.

The principal objection to inoculating in the fummer menths in this climate, arifes from the frequency of bilious diforders at that feafon, to which the preparation necessary for the small-pox probably disposes the body. This caution applies more directly to children who at a certain age are more subject than grown people to a disorder in their bowels in warm weather.

II. The methods of communicating the fmall-pox by Inoculation, have been different in different countries and in the different æras of its progress towards its present, stage of improvement. The scab, dossel of lint, and the thread impregnated with variolous matter and bound up in a gash in the arm, have been laid aside.

We are indebted to Mr. Sutton for the mode of communicating it by a flight puncture with the point of a lancet or needle dipt in fresh matter. As it is difficult sometimes to procure matter in a fresh state, I have been led to use it with equal success by preserving it on lint in a box, and moistning it with cold water just before I used it. Matter may be kept in this way for a month without loofing its infectious quality, provided it is not exposed to heat or moisture. The former destroys its power of infecting as certainly as the falt of tartar destroys the acidity of vinegar. Moisture by remaining long upon the matter, probably destroys its virulence by fubjecting it to fermentation. The longer matter has been kept in a general way, the longer the distance will be between the time of communicating the diforder and the eruptive fever. It will be proper always to yield to the prejudices of our patients in favour of matter taken from persons who have but few pustules. But I am persuaded from repeated obfervations, that the disease is no ways influenced by this circumstance. I am satisfied likewise that there is no difference between the effects of the matter whether it be taken in its watery or purulent state. The puncture should not be larger than is sufficient to draw one drop of bloods

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-No plaster nor bandage should be applied over it. It should be made in the left arm of all subjects. The objections to inoculating in the leg are too obvious to be mentioned. I have heard of the difease being communicated by rubbing the dry skin with the matter. My own observations upon this subject give me reason to suspect the facts that are contained in books relative to this mode of infecting the body. I have bound large pieces of lint dipt in fresh matter for 24 hours upon the arm without producing the disorder. A practitioner of physic in New-Jerfey informed me that he once gave a confiderable quantity of fresh variolous matter in a dose of physic without infecting his patient. I suspect the matter that produces the difease is of the fame nature with certain poisons, which require to be brought in contact with a wound or fore in the body before they produce their effects. I deliver this opinion with diffidence. The subject stands in need of more experiments and investigation.

III. I come now to confider the best method of preparing the body for the small-pox—This must be done 1st by Diet, and 2dly by Medicine.—The Diet should consist chiefly of vegetables. I have never seen any inconvenience

from the free use of milk as a part of the preparative diet. In some habits where a morbid acid prevails in the stomach, we may indulge our patients in a little weak flesh broth two or three times a week with fafety .- Tea, coffee, and even weak chocolate with biscuit or dry toast may be used as usual by persons accustomed to that kind of aliment. Wine and spirits of all kinds should be withheld from our patients during the preparation.—The more acescent their drinks are, the better. It is unnecessary that this change in the diet should take place 'till a day or two before the time of communicating the diforder. The fystem accommodates to a vegetable and low diet in the course of three weeks or a month, fo as to defeat in some measure the advantages we expected from it .-The good effects of it appear to depend in a great degree upon the fuddenness with which we oblige our patients to conform to it. For this reason when we are called upon to inoculate perfons who have lived more than three or four weeks upon a low diet, we should always direct them to live a few days upon animal food before we communicate the disorder to them. By these means we may produce all the good effects of the sudden change in the diet I have already mentioned. 2. The MEDICINES most commonly used

to prepare the body for the small-pox are Antimony and Mercury. The latter has had the preference and has been given in large quantities under a notion of its being a specific antidote to the variolous matter. Many objections might be made to this opinion, I shall mention only three.

- 1. We often see the disorder in a high degree after the system is fully impregnated with mercury.
- 2. We often see the same salutary effects of mercury when given before the disorder is communicated to the body, that we perceive when it is given after Inoculation in which case we are sure the mercury cannot enter into mixture with the variolous matter so as to destroy it.
- 3. If mercury acted specifically in destroying the variolous matter, it would render every other part of the preparation unnecessary, but this we know is not the case, for the neglect or improper use of the vegetable diet or cool regimen is often attended with an extraordinary number, or virulence of the small-pox even in those cases where mercury is given in the largest quantity.

The way in which mercury prepares the body for the small-pox seems to be by promoting the several excretions, particularly that by perspiration, which by diminishing the quantity of the sluids and weakening the tone of the solids, renders the system less liable to a plentiful eruption of the small-pox. But I object to the use of this medicine for the sollowing reasons.

- 1. It effectually deprives us of all the benefits of the cool regimen, for mercury we know always disposes the system to take cold.
- 2. It subjects patients after Inoculation to troublesome and, in some cases, dangerous glandular swellings. This will readily be admitted by all who know the tendency mercury has to stimulate the glandular parts of the body.
- 3. All the good effects of mercury may be procured by Purges which do not subject the body to either of the above mentioned inconveniencies.

The Purges may be fuited to the conftitutions, and in some cases even to the inclinations of our patients. I have seen jalap—rhubarb—senna-—manna—aloes—soluble tartar—Glauber and Epsom salts—the butternut pill—

all given with equal success. The quantity should be sufficient to procure three or four stools every day. A little magnesia should always be mixed with rhubarb and jalap in preparing children. It will be sufficient for the mothers and nurses of infants to conform strictly to the vegetable diet. I have never seen any advantages from giving them even a single dose of physic.

It is hardly necessary to observe that the quality—dose—and number of purges are to be determined by the age—sex—and habits of our patients. A constitution infeebled with a previous disease forbids the use of purges, and requires medicines of a restorative kind. Patients afflicted with cutaneous disorders bear larger and more frequent doses of physic than are indicated in more healthy subjects.

In adult subjects of a plethoric habit, bloodletting is very useful on the third or fourth day after Inoculation. We are not to suppose, that every fat person labours under a plethora. A moderate degree of fat is so far from rendering the disease more violent, especially in children, that I think I have generally sound such subjects have the small-pox more savourably than others. Moderate exercise in the open air should be used during the preparation. But hard labour and every thing that promotes sweat or fatigue as also the extremes of heat and cold, should be avoided.

IV. We come now to consider the treatment of the body during the eruptive fever. On the eighth day after Inoculation our patients are generally seized with the common symptoms of fever. Sometimes this fever appears on the fixth and feventh day after Inoculation. But when it is irregular it is often delayed 'till the ninth and tenth days. I have feen many inflances of it on the fourteenth, a few on the fifteenth and fixteenth, and one case in which it did not come on 'till the eighteenth day after the infection was communicated to the body.-The place where the puncture was made with the lancet or needle generally ferves as an harbinger of the approaching fever. A flight inflammation appears about it and a pock rises up in the center. But this remark is liable to some objections. I have seen four instances in which the fever came on at the expected time, and the diforder went thro' all its stages with the greatest regularity, and yet there

was no fign of an inflammation or pock near the spot where the puncture was made; even the puncture itself became invisible. - On the other hand we fometimes fee an inflammation and pock on the arm appear on the eighth and ninth days without any fever accompanying them. Some physicians pretend that this inflamniation and folitary pock are sufficient to constitute the disease, but repeated experience has taught me to be very cautious in relying upon these equivocal marks. It is true, I have fometimes feen patients fecured against the small-pox both in the natural way and by Inoculation where these marks have appeared; but I have as often feen fuch patients feized afterwards with the fmall-pox in the natural way to the great diffress of families and mortification of physicians.-Upon this account I make it a constant practice to advise a second or third Inoculation where a fever and eruption have been wanting.-As the absence of these symptoms is probably occasioned by the weakness or age of the variolous matter, or the too high state of preparation of the body, we should always guard against both, by making the puncture the fecond time with fresh matter-by subjecting our patients to a less abstemious diet, and by giving fewer doses of physic. I have heard it remarked

that if a slight redness, and a small pimple appeared on the arm on the third day after Inoculation, it was a sign the matter had insected the whole constitution. I acknowledge I have often seen a greater degree of redness on the third than on the second day after Inoculation, but I have not been able to establish a diagnostic mark from it, for I have seen the disease produced on the usual days where the redness has appeared on the second day—and in some cases where it has not appeared until the eruptive sever.

I am led here unwillingly to discuss the old question, Is it possible to have the smallpox in the natural way after Inoculation?-In many of the cases supposed to be the small-pox from Inoculation, it is probable the matter has been taken from the chicken-pox which resembles the small-pox in many of its peculiarities, but in none more than that of leaving pits or marks on the skin. But there are certainly cases where there are the most irrefragable proofs of the infection implanted by Inoculation being of a variolous nature, where the diforder has been afterwards taken in the natural way. In these cases I would suppose the variolous matter produced only a topical or cuticular diforder. We see something analogous to this in nurses who attend pati-

ents

ents in the small-pox. But further-this topical or cuticular infection may be produced by art in perfons who have had the small-pox in the natural way. Some years ago I made a puncture on my left hand with a lancet moistened with variolous matter. On the eighth day an inflammation appeared on the place accompanied with an efflorescence in the neighbourhood of it which extended about two inches in every direction from the fpot where the puncture was made. On the 11th day I was furprifed to find two pocks (if I may venture to call them fuch) the one on the outfide of my fourth finger on my left hand, and the other on my forehead. They remained there for feveral days but without filling with matter, and then dropped off rather in the form of a foft wart than of a common fcab.-Doct. Way of Wilmington repeated the same experiment upon himself, but with an issue to his curiofity more extraordinary than that I have just now related. On the eighth day after he had made a puncture on his hand, a pock appeared on the fpot, which in the usual time filled with matter, from which he inoculated feveral children, who ficken'd at the usual time, and went thro' all the common stages and symptoms of the small-pox-It would feem from these facts that it is neces-

fary the small-pox should produce some impresfion upon the whole fystem in order to render it ever afterwards incapable of receiving an impreffion of a fimilar nature. A fever and an eruption therefore feem necessary for this purpose. As the inflammation of the arm on the eighth day is a fign of the topical and cuticular infection, fo an eruption (tho' ever fo small) seems to be the only certain fign of the infection of the whole fystem. The eruption is the more decifive in its report in proportion as it comes out and goes off in the usual manner of the small-pox in the natural way. In those cases where patients have been secured against a second attack of the disorder, where there have been no obvious fever or visible eruption, I think I have observed an unusual inflammation, and a copious and long continued discharge of matter from the arm. Perhaps this may ferve as an outlet of the matter, which in other cases produces the fever and eruption. I am the more disposed to embrace this opinion from the testimony which several authors have left us of the effects of ulcers in fecuring the body from the infection of the plague. The effects of issues are still more to our purpose. We observe a plentiful discharge of matter from them every time the body is exposed to cold, and

the febrile effects of it upon the fyslem are thereby frequently obviated.—How far a ratio exists between the degrees of inflammation and the difcharge of matter from the arm, and the degrees of fever and eruption, must be determined by future and very accurate observations. If it should appear that there are the least inflammation and fmallest discharge where there have been the highest fever and most copious eruption, and on the contrary, if it should appear that there are the greatest inflammation and discharge where there have been the least fever and smallest eruption, I must beg leave to add without attempting in this place to explain the reasons of it, that the remark, if generally true, is liable to some exceptions. But the subject is involved in darkness: I shall be satisfied if I have brought you within fight of the promifed land. Your own ingenuity like another Jewish leader must conduct you thither.

The indications in the treatment of the body during the eruptive fever are

- Ist To regulate the degree of fever.
- 2d To mitigate troublesome and alarming symptoms.

The fever which produces the eruption is generally of the inflammatory kind. It fometimes therefore comes on with the fymptoms of great heat, preceded with chilliness, determination to the head and breast, and a full hard pulse. The remedies proper in this case are

- A. Bloodletting. The quantity to be drawn must be regulated by the violence of the symptoms,—the constitution—habits, and even country of the patient, and by the season of the year.—I have never found more than one bleeding to the quantity of 12 or 14 ounces necessary in any stage or degree of the eruptive sever of the small-pox by Inoculation.
- B. Cool air is of the utmost consequence in the eruptive sever. The use of this remedy in severs marks an æra not only in the management of the small pox but in medicine. The degrees of cold should always be increased in proportion to the violence of the sever.—Steverooms, so common in this country, should be carefully avoided. The more we oblige our patients to set up and walk in the open air the better. Even in those cases where they languish most for the bed, they should be encouraged rather to lay upon, than under the bed cloaths.—Children should

should be stript of stannel petticoats that come in contact with their skins, and even clouts should be laid aside if possible without great inconvenience, and at any rate they should be often removed.—Great and obvious as the advantages of cold air are in the eruptive sever, it has sometimes been used to an excess that has done mischies.—There are sew cases where a degree of cold below 40 of Farenbeit's thermometer is necessary in this stage of the small-pox. When it has been used below this, or where patients have been exposed to a damp atmosphere some degrees above it, I have heard of inflammations of an alarming nature being produced in the throat and breast.

- c. The bowels, more especially of children, should be kept open with gentle laxatives. And
- p. Cool subacid drinks should be drank plentifully until the eruption is completed.

Sometimes the small-pox comes on with a fever the reverse of that which we have described. The heat is inconsiderable, the pulse is weak, and scarcely quicker than ordinary, and the patient complains of but slight pains in the back and head. Here the treatment should be widely different from that

that which has been mentioned when the fever is of the inflammatory kind. Bleeding in this case is hurtful, and even cool air must be admitted with caution. The business of the physician in this case is to excite a gentle action in the sanguiferous fystem, in order to produce the degree of fever necessary to the eruption of the pock .-For this purpose he may recommend the use of warm drinks, and even of a warm bed with advantage.-If the eruption delays beyond the third day with all the circumstances of debility that have been mentioned, I have frequently ordered my patients to eat a few ounces of animal food and to drink a glass or two of wine with the most desirable success. The effects of this indulgence are most obvious where the weakness of the fever and the delay of the eruption in children have made it necessary to allow it to mothers and nurses .-

The small-pox by Inoculation so seldom comes on with the symptoms of a putrid sever, that little need be said of the treatment proper in such cases. I shall only observe, that the cold regimen in the highest degree promises more success in these cases than in any others.—I have repeatedly been told, that when

the small-pox appears confluent among the A-fricans, it is a common practice for mothers to rub their children all over with pepper, and plunge them immediately afterwards into a spring of cold water.—This, they say, destroys a great part of the pock, and disposes the remainder to a kind-ly suppuration. From the success that has attended the use of the cold bath in putrid severs in some parts \* of Europe mentioned in a former lecture, I am disposed to believe in the essicacy of the African remedy.

The fever generally lasts three days, and the eruption continues for a similar length of time, counting the last day of the fever as the first day of the eruption. But this remark is liable to many exceptions. We sometimes observe the eruption to begin on the first, and often on the second day of the fever, and we sometimes meet

with

<sup>\*</sup> In a differtation entitled "Epidemia verna quæ Wratislaviam, Anno 1737 afflixit," published in the appendix to the Acta Nat. Curios. Vol. X. it appears, that washing the body allover with cold water in putrid fevers, attended with great debility, was attended with fuccess at Breslaw in Silesia. The practice has since been adopted we are told by several of the neighbouring countries. Cullen's first lines of the Practice of Physic.

with cases in which a second eruption comes on after the sever has abated for several days, and the first eruption considerably advanced in its progress towards a complete suppuration.—This is often occasioned by the application of excessive cold, or heat to the body, or by a sudden and premature use of stimulating drinks, or animal food.

I come now to treat of the best method of mitigating troublesome and alarming symptoms.

The only alarming fymptom is convulfions to which children are subject during the time of dentition. These have been less frequent, since the liberal and judicious use of cool air in the eruptive sever than formerly. They are often relieved by putting the seet in warm water. But a more effectual and speedy method of curing them is to expose our patients suddenly to the open air. The colder the air the quicker relies it affords in these cases. To prevent the return of the sits, as well as to allay any disagreeable and troublesome startings, a few drops of Laudanum should be given. They generally yield in a little while to this excellent remedy.

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The next symptom which demands the aid of. our art is the inflammation and fore on the arm. Poultices of all kinds should be laid aside, as tending to increase the inflammation and fore .-Instead of these, the part affected should be washed three or four times a day with cold water. § This application is not only agreeable to our patients, but soon checks the progress of the inflammation, and disposes the fore to heal about the time the eruption is completed. The eyes should likewise be washed frequently with cold water to fecure them from puffules and inflammation.-With respect to those alarming or troublesome symptoms which occur in those cases where the pocks are numerous, or confluent, they happen fo feldom in Inoculation that they do not come properly under our notice in this place. They are moreover fully discussed by Docts. Boerhave, Huxham, Hillary and other practical writers .-

V. I come now in the last place to deliver a few

<sup>§</sup> Where the inflammation on the arm has been so considerable, as not to yield immediately to the application of cold water, I have used the vegeto-mineral water with advantage.—

few directions that are necessary after the eruption and suppuration are over.

It is well known that eruptions of an obstinate nature sometimes follow the small-pox. These I believe, are often occasioned by a too fudden and speedy use of animal food. To guard against these disagreeable consequences of Inoculation, it is of the utmost importance to enjoin a cautious and gradual return to the free use of an animal diet, and at the same time it will be necessary to give our patients a dose or two of purging physic.

Thus Gentlemen have I delivered to you a short history of the new method of inoculating for the fmall-pox. I am aware that prejudices are entertained against some parts of it by phyficians of the most ancient name and character among us. I have witneffed the effects of the old and new methods of preparing the body, upon many thousand patients, and I am satisfied not only from my own observations, but from the experience of Gentlemen upon whose judgments I rely more than upon my own, that the new method is by far the fafest and most successful .- Added to this, I can assure my pupils, that I have never known a fingle instance of a

patient

patient prepared and treated in the manner I have described, that ever had an abscess after the small-pox, or even such an inflammation or fore upon the arm as required the application of a poultice.—

#### FINIS.









